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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,755	01/29/2001	William Pohlman	35706.0900	8652

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EXAMINER

TRUJILLO, JAMES K

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/771,755

Applicant(s)

POHLMAN, WILLIAM

Examiner

James K. Trujillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4 and 5</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The office acknowledges the receipt of the following and placed of record in the file:

Declaration dated 3/26/01, IDS dated 5/3/01, and Supplemental IDS dated 12/31/01.

2. Claims 1-16 are presented for examination.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s):

a. As per claim 8, "wherein the apparatus is formed using SiGe". The implementation of the SiGe is not shown.

b. As per claim 6, "wherein at least to of said plurality of transmission lines are configured to cancel noise". The configuration that cancels noise is not shown.

c. As per claim 9, "synchronic clock signal to a microprocessor". No processor is shown in the drawings.

d. As per claim 14, "wherein the transmission line is shielded". Shielding is not shown.

No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

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4. Claim 5 objected to because of the following informalities: "said second receiver" should be changed to "said first driver". The "said second receiver" lacks proper antecedent basis and only the first driver and first receiver are claimed as being coupled. For examination purposes it will be assumed that "said first driver" is used instead of "said second receiver". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
6. Claim 5 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. Claim 5 recites the limitation "second receiver" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Zhu, U.S. Patent 5,866,924.

10. As to claim 1, Zhu taught (as per claim 1) an apparatus for distributing synchronized clock signals to multiple sites comprising:

- a. a clock input configured as a solder bump (solder bump 940c-i) [figure 9];
- b. a first driver coupled (one of buffers, upper left of 1030a as an example, at the tips of "H" clock tree depicted as 1030a-d) to said clock input [figures 9 and 10];
- c. a first receiver (clock sinks not shown) coupled to said driver [figures 7, 10, col. 9 lines 42-49 and col. 10 line 64 et seq.].

Specifically, Zhu teaches an apparatus to distribute synchronized clock signals. The clock signals are routed such that clock skews are minimized [col. 9 lines 10]. Zhu explains that various clock trees may be used to be implemented in both package and integrated circuit such as those depicted in figures 10A and 10B [col. 10 line 64 et seq.]. Zhu discloses that clock trees 1030a-d may be used within the integrated circuit. Zhu describes the local clock trees using figures 7, 9 and 10B. Figure 7 describes how the clock is partitioned between the global and local clock trees. Figure 9 describes where the global clock and local clocks are to be arranged

physically in the package layer and integrated circuit layer. Zhu describes two integrated circuits as 900a and 900b having local clock tree and package 970 having the global clock tree. Figure 10B describes a specific arrangement of the local clock tree. Thus, it would follow that Zhu teaches that 1030a-d would be used in 900a and 900b whereby 920a-g would be the buffers depicted as buffers in the center of 1030a-d.

11. As to claim 2, Zhu teaches the apparatus according to claim 1 described above. The apparatus of Zhu further comprises a first transmission line (line connecting a clock sink, not shown in Zhu, to the upper left buffer at the tip of the "H" clock tree) spanning between said first driver and said first receiver [col. 9 lines 43-45 figures 9, 10 and related text]. Zhu does not show the receiver (sink) but such a receiver must exist in order for the clocks to be useful.

12. As to claim 3, Zhu teaches the apparatus according to claim 2 described above. Zhu teaches an apparatus further comprising a second driver (one of buffers, upper right buffer of 1030a as an example, at the tips of "H" clock tree depicted as 1030a-d), a second receiver (clock sinks not shown), and a second transmission line (line connecting a clock sink, not shown in Zhu, to the upper right buffer at the tip of the "H" clock tree).

13. As to claim 9-12 and 15-16, Zhu taught the claimed apparatus therefore he also taught the claimed microelectronic device.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu.

16. As to claim 4, Zhu teaches the apparatus according to claim 1 described above. Zhu does not expressly disclose wherein said first transmission line and said second transmission line comprise substantially equal time delay. However, Zhu suggests that clock delay to different sinks is one of the problems his invention is directed toward. Zhu suggests that the transmission lines to clock sinks should be symmetrical [col. 9 lines 50-53]. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Zhu by making the first and second transmission lines have equal delay because Zhu suggests that they should be symmetrical. Doing so would reduce undesirable clock skew in Zhu.

17. As to claim 5, Zhu teaches the apparatus according to claim 1 described above. Zhu does not expressly disclose wherein multiple transmission lines span between said first receiver and said first driver. Zhu teaches that speed and power consumption are important and should be reduced. However, one of ordinary skill in the art will readily recognize that multiple transmission lines would reduce the resistance between the first receiver and first driver. Doing so would desirably reduce the amount of delay and reduce the power consumed by circuit.

18. As to claim 7, Zhu taught the apparatus according to claim 1 described above. Zhu does not expressly disclose wherein an output is configured as a bump. Zhu teaches having multiple sinks where the clock signal is used. Zhu further teaches that location of where the drivers are is not intended to limit the scope of his invention [col. 10 lines 42-44]. Zhu suggests that his buffers may be placed in the global clock tree [figures 8 and 10A]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Zhu by locating the

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buffers as described above in the package layer as suggested by Zhu. Doing so would decrease the delay because the package layers generally contain clock lines with less delay. The output of the buffers such as the top left buffer in figure 10A would be coupled to a solder bump.

19. As to claim 13, Zhu taught the claimed apparatus therefore he also taught the claimed microelectronic device.

20. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu in view of Ryum et al., U.S. Patent 5,981,345.

21. As to claim 8, Zhu taught the apparatus according to claim 1 described above. Zhu does not expressly disclose wherein the apparatus is formed using SiGe.

Ryum teaches an apparatus that is formed using SiGe [col. 5 line 65 through col. 6 line 9].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Zhu by using SiGe in his apparatus as taught Ryum. One would have made the modification because Ryum teaches because using SiGe would increase the speed of the apparatus as compared to a conventional device.

22. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu in view of Sharpe-Geisler 6,353,352 (hereinafter "Sharpe").

23. As to claim 6, Zhu teaches the apparatus according to claim 1 described above. Zhu does not expressly disclose wherein at least two of said plurality of transmission lines is configured to cancel noise.

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Sharpe teaches an apparatus having a plurality of transmission lines configured to cancel noise [figure 10 and col. 5 lines 4-25].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Zhu by using the transmission lines as taught by Sharpe. One of ordinary skill would have done so to desirably eliminate noise in Zhu.

24. As to claim 14, Sharpe also teaches shielding. Therefore, claim 14 is rejected for similar reasoning as set forth herein above.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 5,861,764 to Singer et al. This patent teaches a technique for reducing skew.

U.S. Pat. No. 6,184,736 to Wissell et al. This patent teaches a system for minimizing cross-talk and electromagnetic interference in clock lines.

U.S. Pat. No. 6,092,211 to Hozumi. This patent teaches a system for distributing clock signals.

U.S. Pat. No. 6,211,703 to Takekuma et al. This patent teaches a system where phases of a clock are adjusted to have an equal delay.

Japan Pat. No. JP410097564 to Yamadou. This patent teaches a clock distribution system that reduces clock skew.

"Clock skew reduction in ASIC logic design: a methodology for clock tree management" Balboni, A.; Costi, C.; Pellencin, M.; Quadrini, A.; Sciuto, D.; Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions on, Volume: 17, Issue: 4, April 1998, Pages:344 - 356.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James K. Trujillo whose telephone number is (703) 308-6291.

The examiner can normally be reached on M-F (7:30 am - 5:00 pm) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Lee can be reached on (703) 305-9717. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James Trujillo
March 2, 2004



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